In the Claims:

The claims are unchanged. Applicants submit the claims as currently on file for the convenience of the Examiner.

1.   (Previously Amended) A metadata model transformer for transforming a metadata model, the metadata model having a lower layer containing one or more model objects having a lower degree of abstraction and a higher layer containing one or more model objects having a higher degree of abstraction, the transformer comprising:

a lower-to-higher transformation having:

means for obtaining information from a model object in the lower layer;

means for abstracting the information by adding business intelligence; and

means for creating a model object in the higher layer corresponding to the model object in the lower layer.

2.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a lower layer transformation having:

means for obtaining information from a model object in the lower layer;

means for modifying the obtained information; and

means for transforming the model object in the lower layer based on the modified information.

3.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a lower layer transformation having:

means for obtaining information from a model object in the lower layer;

means for determining a specific feature included in the obtained information; and

means for creating a new model object in the lower layer based on the specific feature.

4.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a lower layer transformation having:

means for obtaining relationship information between multiple model objects in the lower layer; and

means for creating a new model object in the lower layer based on the relationship information.

5.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a higher layer transformation having:

means for obtaining information from a model object in the higher layer;

means for modifying the obtained information; and

means for transforming the model object in the higher layer based on the modified information.

6.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a higher layer transformation having:

means for obtaining information of a model object in the higher layer;

means for determining a specific feature included in the obtained information; and

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means for creating a new model object in the higher layer based on the specific feature.

7.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a higher layer transformation having:

means for obtaining relationship information between multiple model objects in the higher layer; and

means for creating a new model object in the higher layer based on the relationship information.

8.   (Previously Amended) A metadata model transformer as claimed in claim 1 further comprising:

a higher layer transformation having:

means for selecting a subset of the model objects in the higher layer; and

means for creating a new model object in the higher layer based on the selected subset of the model objects in the higher layer.

9.   (Previously Amended) A metadata model transformer for transforming a metadata model that represents one or more data sources having physical data, the metadata model having a data access layer containing data access model objects, a business layer containing business model objects, and a package layer containing package model objects, the transformation comprising:

one or more data access model transformations for refining description of the

physical data in the data source expressed by the data access model objects;

one or more data access to business model transformations for constructing business model objects based on the data access model objects;

one or more business model transformations for refining the business rules expressed by the business model objects; and

one or more business to package model transformations for constructing package model objects based on the business model objects.

10. (Original) A metadata model transformer as claimed in claim 9, wherein the data access model transformations refines the description by adding new data access model objects to data access model objects which are constructed via import from the data sources or one or more metadata sources.

11. (Previously Amended) A metadata model transformer as claimed in claim 9, wherein the business model transformations refine the business rules by changing the business model objects.

12. (Original) A metadata model transformer as claimed in claim 11, wherein the business model objects include business model objects which are constructed via import from one or more metadata sources.

13. (Previously Amended) A metadata model transformer as claimed in claim 9 further comprising:

one or more package model transformations for constructing a new package model object based on the package model objects in the model.

14. (Original) A metadata model transformer as claimed in claim 13, wherein the package model objects include package model objects which are constructed via import from one or more metadata sources.

15. (Original) A metadata model transformer as claimed in claim 9 further comprising:

a name mutation transformation for changing names of objects in the model based on user defined rules.

16. (Original) A metadata model transformer as claimed in claim 9, wherein the data access model transformations include a transformation which creates a new data access model object based on the data access model objects contained in the data access layer.

17. (Original) A metadata model transformer as claimed in claim 16, wherein the data sources contain tables having columns and indexes;

the data access model objects include data access tables, data access columns and data access indexes which respectively describe information about the tables, columns and indexes in the data sources; and

the data access model transformations include a data access join constructing transformation for constructing a data access join between data access tables based on the data access indexes.

18. (Original) A metadata model transformer as claimed in claim 16, wherein the data sources contain tables having columns and indexes;

the data access model objects include data access tables, data access columns and data access indexes which respectively describe information about the tables, columns and indexes in the data sources; and

the data access model transformations include a data access key constructing transformation for creating a data access key for a data access table based on the data access indexes.

19. (Original) A metadata model transformer as claimed in claim 16, wherein the data sources contain at least one of tables having columns and indexes, views having columns or files having columns or fields;

the data access model objects include at least one of data access tables, data access views, data access files, data access columns and data access

indexes which respectively describe information about the tables, columns of the tables, indexes of the tables, the views, the columns of the views, the files, and the columns or fields of the files in the data sources; and

the data access model transformations include a table extract constructing transformation for constructing a table extract based on the data access tables, the data access views and the data access files.

20.   (Original) A metadata model transformer as claimed in claim 16, wherein

the data access model objects include one or more logical cube, each of which defines a multidimensional space represented in a number of physical storage formats; and

the data access model transformations include a data access cube constructing transformation for constructing data access cubes to instantiate the multidimensional space defined by each logical cube.

21.   (Original) A metadata model transformer as claimed in claim 9, wherein

the data access to business model transformations include a basic business model constructing transformation which obtains information about a data access model object in the data access layer, and create a business model object corresponding to the data access model object.

22.   (Previously Amended) A metadata model transformer as claimed in claim 21, wherein

the business model objects include entities that exist as an implementation artifact of a many to many relationship, and business joins associated with the entities; and

the business model transformations include a many to many join relationship fixing transformation for locating the entities, and replacing the associated business joins with a single business join.

23.   (Original) A metadata model transformer as claimed in claim 21, wherein

the business model objects include entities that are related via a 1:1 join relationship; and

the business model transformations include an entity coalescing transformation for locating the entities that are related via a 1:1 join relationship, and coalescing the located entities into a single entity.

24.   (Original) A metadata model transformer as claimed in claim 21,

the business model objects include one or more redundant joins that express the transitivity of two or more other join relationships in the business layer; and

the business model transformations include a redundant join relationship eliminating transformation for locating the redundant joins, and eliminating the redundant joins from the business layer.

25.   (Original) A metadata model transformer as claimed in claim 21, wherein

the business model transformations include a subclass relationship introducing transformation for introducing a new entity with a subclass relationship into the business layer.

26.   (Original) A metadata model transformer as claimed in claim 21, wherein

the business model objects include an entity acting as a lookup table with respect to the other entity, and a business join between the entities, the business join is an associate type; and

the business model transformations include an entity referencing transformation for locating the entity acting as a lookup table, and changing the business join which is an association type to a business join which is a reference type.

27.   (Original) A metadata model transformer as claimed in claim 21, wherein

the business model transformations include an attribute usage determining transformation for determines the usage of an attribute based on how it is used by other business model objects.

28.   (Original) A metadata model transformer as claimed in claim 21, wherein the business model transformations include a date usage identifying transformation for examining attributes to determine where dates are used in the attributes.

29.   (Original) A metadata model transformer as claimed in claim 9, wherein the business to package model transformations include a basic package model constructing transformation for constructing a package layer by forming a package with package model objects which corresponds to a subset of the business model objects.

30.   (Original) A metadata model transformer as claimed in claim 13, wherein the package model transformations include a special package construction transformation for constructing a specific package which is usable by a specific client application from a generic package.

31.   (Original) A metadata model transformer as claimed in claim 9 further comprising one or more multidimensional model transformations for a multidimensional model.

32.   (Original) A metadata model transformer as claimed in claim 31, wherein the multidimensional model transformations include a measure identifying and measure dimension constructing transformation for analyzing the structure of each data source to identify entities that contain measure candidates and identifying a reasonable set of measures.

33.   (Original) A metadata model transformer as claimed in claim 31, wherein the multidimensional model transformations include a category dimension and level constructing transformation for analyzing each data source, and constructing dimensions and levels for the source model.

34.   (Original) A metadata model transformer as claimed in claim 32, wherein the multidimensional model transformations include a logical cube constructing transformation for constructing a set of logical cubes based on the dimensions in a corresponding data source.

35.   (Previously Amended) A method for transforming a metadata model for containing model objects, the metadata model having multiple layers including a lower layer containing one or more model objects having a lower degree of abstraction and a higher layer containing one or more model objects having a higher degree of abstraction, the method comprising steps of:

obtaining information from a model object in the lower layer;

abstracting the information by adding business intelligence; and

creating a model object in the higher layer corresponding to the model object in the lower layer.

36.   (Original) A method for transforming a metadata model that represent one or more data sources having physical data, the metadata model having a data access layer containing data access model objects, a business layer containing business model objects, and a package layer containing package model objects, the method comprising steps of:

refining description of physical data in the data sources expressed by the data access objects;

constructing business model objects based on the data access objects;

refining business rules expressed by the business model objects; and

constructing package model objects based on the business model objects.

37. (Original) A method as claimed in claim 36, wherein the step of refining the description comprises a step of adding new data access model objects to data access model objects which are constructed via import from the data sources or one or more metadata sources.

38. (Original) A method as claimed in claim 36, wherein the step of refining the business rules comprises a step of changing the business model objects.

39. (Original) A method as claimed in claim 36, wherein the step of refining the business rules uses the business model objects that include business model objects which are constructed via import from one or more metadata sources.

40. (Previously Amended) A method as claimed in claim 36, further comprising a step of constructing a new package layer based on the business model objects in the model.

41. (Previously Amended) A method as claimed in claim 40, wherein the step of constructing a new package layer uses the business model objects that include business model objects which are constructed via import from one or more metadata sources.

42. (Original) A method as claimed in claim 36 further comprising a step of changing names of objects in the model based on user defined rules.

43. (Previously Amended) A computer readable memory for storing code which identifying instructions for transforming a metadata model for containing model objects, the metadata model having multiple layers including a lower layer containing one or more model objects having a

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lower degree of abstraction and a higher layer containing one or more model objects having a higher degree of abstraction, the instructions comprising:

obtaining information from a model object in the lower layer;

abstracting the information by adding business intelligence; and

creating a model object in the higher layer corresponding to the model object in the lower layer.

44. (Previously Amended) A computer data signal representing code which identifying instructions for transforming a metadata model for containing model objects, the metadata model having multiple layers including a lower layer containing one or more model objects having a lower degree of abstraction and a higher layer containing one or more model objects having a higher degree of abstraction, the instructions comprising:

obtaining information from a model object in the lower layer;

abstracting the information by adding business intelligence; and

creating a model object in the higher layer corresponding to the model object in the lower layer.